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| | <p style="text-align: center;">BCM SCHOOL BASANT AVENUE DUGRI ROAD LUDHIANA ASSIGNMENT OF INTEGRALS XII SCI. MATHS (AUGUST 2nd ASSIGNMENT)</p> | |
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| | Answer Key (Integrals) |
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| 1 | D |
| 2 | D |
| 3 | D |
| 4 | B |
| 5 | $\frac{\tan^7 x}{7} + C$ |
| 6 | $\frac{1}{3} \log \sec(3x) - \log \sec x - \frac{1}{2} \log \sec(2x) + c$ |
| 7 | $\frac{e^x}{(x-3)^2} + C$ |
| 8 | $= \tan^{-1}(\sin x) + \log \left \frac{\sqrt{1+\sin^2 x}}{1-\sin x} \right + C$ |
| 9 | <p>Let $I = \int \frac{\sqrt{x}}{\sqrt{a^3 - x^3}} dx = \int \frac{\sqrt{x}}{\sqrt{(a^{3/2})^2 - (x^{3/2})^2}} dx$</p> <p>Put $x^{3/2} = a^{3/2} t$</p> <p>$\Rightarrow \frac{3}{2} x^{1/2} dx = a^{3/2} dt \Rightarrow \sqrt{x} dx = \frac{2}{3} a^{3/2} dt$</p> <p>$\therefore I = \int \frac{\frac{2}{3} a^{3/2}}{\sqrt{(a^{3/2})^2 - (a^{3/2} t)^2}} dt$</p> <p>$= \frac{2}{3} a^{3/2} \int \frac{dt}{a^{3/2} \sqrt{1-t^2}}$</p> <p>$= \frac{2}{3} \int \frac{dt}{\sqrt{1-t^2}} = \frac{2}{3} \sin^{-1} \left(\frac{t}{1} \right) + C$</p> <p>$\left[\because \int \frac{dx}{a^2 - x^2} = \sin^{-1} \left(\frac{x}{a} \right) + C \right]$</p> <p>$= \frac{2}{3} \sin^{-1} \left(\frac{x^{3/2}}{a^{3/2}} \right) + C \quad \left[\text{put } t = \frac{x^{3/2}}{a^{3/2}} \right]$</p> <p>$= \frac{2}{3} \sin^{-1} \left(\sqrt{\frac{x^3}{a^3}} \right) + C$</p> |



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$$\frac{1}{6} \log |1 - \cos x| + \frac{1}{2} \log |1 + \cos x|$$

$$- \frac{2}{3} \log |1 + 2\cos x| + C$$

